"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

BREUS, K. , POLOZHIY, G.

Vadim Evgen'evich D'iachenko; obituary. Ukr.mat.zhur. 6 no.3: 367-368 '54. (MLRA 8:5)
(D'iachenko, Vadim Evgen'evich, 1896-1954)

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124-58-9-10108

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 9, p 97 (USSR)

AUTHOR: Polozhiy [Polozhiy, H.M.]

TITLE: On Boundary Problems of the Theory of the Functions of a Complex Variable in the Theory of Filtration (O krayevykh zadachakh teorii funktsiy kompleksnogo peremennogo v teorii fil'tratsii) [Pro hranychni zadachi teoriyi funktsiy kompleksnoho zminnoho v teoriyi fil'tratsiyi]

PERIODICAL: Nauk. zap. Kyyivs'k. un-t, 1954, Vol 13, Nr 8, pp 121-132

ABSTRACT: A classification is adduced for those plane problems of the theory of filtration which admit a solution by means of conformal transformations on the semiplane of two generic sections in which the flow under consideration is represented by contours described by straight-line segments and circular arcs. Depending on the combination of the sections represented, the following six types of problems are segregated: 1) z, w; 2) z, p; 3) z, w'; 4) p, w; 5) p, w'; 6) w, w'; where $z = x + iy$ and (x, y) are the coordinates of the section occupied by the flow, $w = \varphi + i\psi$ is the complex potential, $w' = dw/dz$ is the complex velocity, and $p = w - ikz$ is the Zhoukovskiy function (k is the filtration coefficient). For each

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of these types of problems it is shown just which forms of external flow boundaries are represented in both sections under consideration in terms of straight lines and circular arcs. In addition to the six types indicated, a seventh type of problem is pointed out which is cited as an example of the Dirichlet problem for the function arg d^2z/dw^2 introduced by B. B. Davison. In those cases in which the free surface of the flow is subjected to an evaporation or infiltration ε = const, certain problems can be more simply solved by means of conformal representations on the semiplane of the section $p = w - ikz$ and its other version, $p = w - i\varepsilon z$, proposed by B. B. Davison. It should be noted that the aboveindicated classification does not comprise certain forms of the external boundaries of a subterranean flow which have been examined in works by the reviewer (Dokl. AN SSSR, 1949, Vol 64, Nr 2; Inzhenernyy sb., 1950, p 7), also by V. N. Shchelkachev and Gusseyn-Zade (Neft. kh.-vo, 1953, Nr 12, pp 22-29; RzhMekh, 1955, Nr 1, p 282 et al.). It is shown that all seven types of filtration problems can be reduced to the basic boundary problem of the theory of functions for a circle or a semiplane. Therein four groups of problems exist, for which the solutions are obtained in explicit form. The desired function is found from its known values on the boundary of the semiplane or on the circle by means of the formulas for boundary problems of the theory of functions or by means of the Keldysh-Sedov formula.

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On Boundary Problems of the Theory of the Functions of a Complex (cont.)

Of particular interest is the fourth group, in which w'' (w') appears as the desired function; this case includes those problems of the theory of filtration in which the external contour of the flow consists of a horizontal or inclined impervious bottom stratum, a free surface (with or without infiltration) and a seepage area. It is essential that for problems of the fourth type the contour conditions along the abovementioned boundary must be expressed in a comparatively simple form. Bibliography: 17 references.

N. N. Verigin

1. Fluid flow--Mathematical analysis 2. Boundary layer--Theory 3. Functions --Theory 4. Functions--Theory 5. Hydrodynamics--USSR

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POLOZHIY, G.N.

USSR

Položii, G. N. A theorem on the correspondence of boundaries and variational theorems for certain elliptic systems of differential equations. Dokl. Akad. Nauk SSSR (N.S.) 95, 927–930 (1954). (Russian)

Let $w=u+iv$ satisfy the system

(*) $$v_y=au_x+bu_y, \quad v_x=-du_x-cu_y$$

with $\delta=ac-(\frac{1}{2}b+\frac{1}{2}d)^2$ positive and a positive. If G is a domain in the xy-plane in which a, c, δ, $|b|$ and $|d|$ are bounded, and if G^* is the map of G in the w-plane, the following theorem on the correspondence of the boundaries L and L^* of G and G^* is established: If a, b, c, d have first derivatives which satisfy a Hölder condition and if all points of L and L^* are attained in the mapping of G onto G^* by (*), then the function $w=f(z)=u+iv$ and the inverse function $z=x+iy=f^{-1}(w)$, are uniformly continuous in the closed domains $G+L$, G^*+L^*; thus the mapping gives a one-one continuous correspondence between the points of the closed domains. This extends previous works of the author for systems (*) [same Dokl. (N.S.) 58, 1275–1278 (1947); 63, 615–618 (1948); MR 9, 507; 10, 526]. In addition, certain variational theorems are stated. *M. H. Protter.*

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POLOZHIY, G. N.

2

Položij, G. N. On an addendum to a theorem on motion of boundary points. Ukrain. Mat. Ž. 7 (1955), 339–342. (Russian)

1-F/W

Math

Phy

The author has shown [Uspehi Mat. Nauk (N.S.) 7 (1952), no. 6(52), 203–205; MR 14, 549] that if G is a simply-connected region lying inside another simply-connected region G' in such a way that G and G' have a Jordan arc γ as a common part of their frontiers, then, under a conformal mapping of G onto G', there can be no more than three fixed points in the interior of γ. In the event that there are three fixed points, the points of γ gravitate towards the outer two under the conformal map and are repelled from the middle fixed point, while, in the case of two fixed points, one of the points attracts and the other repels. In the present note, the author shows that, if the derivative of the mapping function exists on γ, its modulus is less than unity at an attractive fixed point and greater than unity at the repellent fixed point.

A. J. Lohwater (Ann Arbor, Mich.)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N. (Kiyev)

Effective solution of the problem for approximate conformal mapping of simply-connected and doubly-connected domains and the determination of Christoffel-Schwarz constants by means of electrohydrodynamic analogies. Ukr.mat.zhur. 7 no.4:423-432 '55. (MLRA 9:5)
(Conformal mapping) (Electromechanical analogies)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N.

1-F/W/

Položil, G. N. Variational-topological theorems on boundary problems of the theory of torsion of shafts of variable cross-section. The method of preservation of domain and of majorizing domains. Izv. Akad. Nauk SSSR. Ser. Mat. 19 (1955), 245-270. (Russian)

Let $ABCDA$ be a contour bounding a region G in which AB, DC are equipotential curves ϕ=const. and AD, BC are stream lines ψ=const. If A is displaced to a new position A' on the curve AB, a new region G_1 bounded by the contour $A'BCDA'$ is formed. Other regions G_1 can be obtained from G by displacing various combinations of the original points in a similar fashion. By mapping G and G_1 upon their respective hodograph planes and using results of his earlier work [Dokl. Akad. Nauk SSSR (N.S.) 58 (1947), 1275-1278; Mat. Sb. N.S. 32(74) (1953), 485-492; MR 9, 507; 15, 320], the author proves a sequence of theorems on the behavior of certain functions of ϕ and ψ as G is deformed into G_1.

The results are couched in the language of the problem of torsion of a shaft of revolution with variable cross-section. In this problem ψ is the stress function. As an application, numerical bounds for the maximum value of the stress vector are obtained for shafts with annular grooves of hyperbolic and circular section. The author claims that in particular cases his method furnishes a mathematical substantiation of St.-Venant's principle and gives to it a quantitative character. *R. N. Goss.*

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POLOZHIY, G. N

1

Položiĭ, G. N. Conformal mapping of simply connected and doubly connected regions and the determination of the Christoffel-Schwarz constants by means of a mathematical apparatus. Dokl. Akad. Nauk SSSR (N.S.) 104 (1955), 15-18. (Russian)

A simple electrical device, based on the measurement of the resistance of conductors, is proposed for the determination of the constants appearing in the Christoffel-Schwarz formula for the conformal mapping of a circle on a given polygonal domain. An analogous procedure is indicated for determining whether two given doubly-connected domains are conformally equivalent.

W. Seidel (Notre Dame, Ind.).

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P[illegible], G. N.

Call Nr: AF 1108825

Transactions of the Third All-union Mathematical Congress (Cont.) Moscow, Jun-Jul '56, Trudy '56, V. 1, Sect. Rpts., Izdatel'stvo AN SSSR, Moscow, 1956, 237 pp.

Paulauskas, V. K. (Vil'nyus). On the Approximations of Functions With Their Derivatives. 95

Mention is made of Kolmogorov, A. N.

Polozhiy, G. N. (Kiyev). Integration With Respect to Conjugated Variables. 95-96

Mention is made of Lukomskaya, M. A. and Markushevich, A. I.

There are 5 references, 4 of which are USSR, and 1 English.

Rakhmanov, B. N. (Saratov). On Some Classes of Analytic Functions. 96

Remez, Ye. Ya. (Kiyev). Some Problems Connected With Analyzing the Unique or Multivalued Solution of the Chebyshev Problem for Incompatible Systems of Linear Equation. 97-98

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G. M.

3/4H1

Položil, G. M. Method of solution of the problem of the bending of prismatic rods. Akad. Nauk Ukrain. RSR. Prikl. Meh. 2 (1956), 257-269. (Ukrainian. Russian summary) 1-FW

A simple method is given for estimating the maximum stress in a symmetrically bent rod. This method is based on the utilization of the properties of subharmonic functions. The application of the method is illustrated by examples which give estimates for the maximum stress in rods with rectangular cross section with semicircular cutouts. *H. P. Thielman* (Ames, Ia.).

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N.

General solution of the contact problem with a rigid contour for an arbitrary polygon and an arbitrary polygonal opening. Nauk. zap.Kyiv.un. 16 no.2:35-51 '57. (MIRA 11:11)
(Elasticity)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

20-1-1/64

AUTHOR: POLOZHIY, G.N.

TITLE: On Some Summary Characteristics of the State of Stress at the Bending of Prismatic Bars.
(O nekotorykh summarnykh kharakteristikakh napryazhennogo sostoyaniya pri izgibe prizmaticheskikh sterzhney. Russian).

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol 114, Nr 1, pp 45 - 48 (U.S.S.R.)

ABSTRACT: The paper under review describes a relatively simple method for the estimation of the maximum stresses at the bending of prismatic bars. This method utilizes the special properties of the subharmonic functions. Furthermore the paper under review determines some general properties of the state of stress (these properties characterize the state of stress as a whole). First of all, expressions are given for the tangential stress in a prismatic bar. The author of the paper under review devotes particular attention to the case where the cross section G is symmetrical with respect to the x-axis. With the aid of the principle of symmetry at the analytical continuation it is possible to demonstrate that in this case the bending function is a straight function of y, and that the constant τ (denoted as rigidity in the paper under review) equals zero. If in this context, the 'complex bending function' $W(z) = U + iV$ $(z = x + iy)$ is introduced, then after some computations the fol-

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POLOZHIY, G.N. [Polozhii, H.M.]; CHEMERIS, V.S. [Chemerys, V.S.]

Problem of the use of p-analytical functions in the axisymmetrical theory of elasticity [with summary in English]. Dop.AN URSR no.12:1284-1287 '58. (MIRA 12:1)

1. Kiyevskiy gosudarstvennyy universitet. Predstavil akademik AN USSR I.Z.Shtokalo.

(Elasticity)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

AUTHOR: Polozhiy, G.N. 20-118-5-7/59

TITLE: On a Method for Solving Integral Equations (Ob odnom metode resheniya integral'nykh uravneniy)

PERIODICAL: Doklady Akademii Nauk,1958, Vol 118, Nr 5, pp 876-878 (USSR)

ABSTRACT: Let the integral equation

$$(1) \qquad \int_a^b K(x,s)\varphi(s)ds = \mu\varphi(x) + F(x)$$

be given. μ is called an eigenvalue of $K(x,s)$, if (1) for $F(x) \equiv 0$ possesses a solution different from zero. Then the solution is called an eigenfunction of $K(x,s)$ corresponding to μ. Let the Lebesgue integrals

$$C^2 = \int_a^b |K(x,s)^2| ds \quad , \quad B^2 = \int_a^b \int_a^b |K(x,s)^2| dxds \; ,$$

$$D^2 = \int_a^b |F(x)|^2 dx \quad , \quad E^2 = \int_a^b |\varphi(x)|^2 dx$$

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On a Method for Solving Integral Equations 20-118-5-7/59

Theorem: If $K(x,s)$ is real and symmetric and $\mu = 0$ is no eigenvalue, then the sequence

$$\tilde{\varphi}_{m+1}(x) = G\tilde{\varphi}_m + \frac{2}{\sigma} F^*(x) \qquad m = 0,1,2,\ldots$$

converges for $m \to \infty$ in the mean to the exact solution of (1) for $\mu = 0$. Here it is

$$G\varphi = \varphi(x) - \frac{2}{\sigma} \int_a^b K_2(x,s)\varphi(s)ds$$

$$F^*(x) = \int_a^b K(x,s)\, F(s)\, ds \qquad \sigma > B^2$$

and $\tilde{\varphi}_0(x)$ is arbitrary.

Two further theorems concern the case of a complex symmetric kernel. There are 9 references, 6 of which are Soviet.

ASSOCIAITION: Kiyevskiy gosudarstvennyy universitet imeni T.G.Shevchenko (Kiyev State University imeni T.G. Shevchenko)

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16(1)

SOV/38-23-2-9/10

AUTHOR: Polozhiy, G.N.

TITLE: On a Method for the Solution of Integral Equations (Ob odnom metode resheniya integral'nykh uravneniy)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya matematicheskaya, 1959, Vol 23, Nr 2, pp 295 - 312 (USSR)

ABSTRACT: The author proposes an iteration method for the solution of Fredholm integral equations. The method uniformly converges for arbitrary improper values of the parameter λ in the equations of second class, and converges on the average for an equation of first class which possesses a solution for every second term. Neither the smallness of λ nor particular properties of the spectrum of the eigen values are required. Real as well as complex kernels are admitted.
There are 8 references, 4 of which are Soviet, 3 German, and 1 French.

PRESENTED: by S.L. Sobolev, Academician

SUBMITTED: August 23, 1957

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L 25124-65 EWT(d)/Pg-4 IJP(c)

ACCESSION NR: AT5002842 S/3123/64/000/001/0124/0144 15

B+1

AUTHOR: Polozhiy, G.N.; Chalenko, P.I.

TITLE: The pole method of solving integral equations 16

SOURCE: AN UkrSSR. Institut matematiki. Voprosy matematicheskoy fiziki i teorii funktsiy, no. 1, 1964, 124-144

TOPIC TAGS: integral equation, Fredholm second order equation, pole method, iteration method, computer program

ABSTRACT: In recent years, numerous papers and books have discussed numerical methods for the solution of Fredholm second order integral equations (see, e.g., E.G. Kimme et al., Linear Integral Equations, Math. for Digital Computers, vol. 2, 1959; A.I. Nesterenko, V.G. Korepov, Visnik KDU, ser. astr., matem. ta mekh., vol. 2, no. 2, 1959). An experiment, carried out by the authors on the IBM 704 at the Computer Center of Michigan University using methods published earlier (G.N. Polozhiy, DAN SSSR, vol. 118, no. 5, 1958; Izv. AN SSSR, vol. 23, no. 2, 1959), showed that iteration methods are particularly suitable for the solution of the above-mentioned problem using high-speed com-

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puters. Preliminary transformations help to eliminate the divergence of the iteration process for large values of the integral equation parameter. The pole method proposed for the solution of integral equations consists of a special combination of three known methods: 1) simple iteration, 2) finite differences, and 3) kernel approximation. The two sections of the paper cover averaging over the area and over the poles, respectively. Both cases are illustrated by the calculation of

$$\varphi(x) = f(x) + \lambda \int_0^1 (xe^{xs} + 100)\varphi(s)\,ds. \tag{1}$$

Orig. art. has: 115 formulas.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: MA, DP

NO REF SOV: 013 OTHER: 006

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

L 32336-65 EWT(d) IJP(c)

ACCESSION NR: AP5008281 S/0021/64/000/010/1277/1280

AUTHOR: Polozhiy, H. M. (Polozhiy, G. N.)

TITLE: Representation of p-harmonic functions through harmonic functions and their derivatives

SOURCE: AN UkrRSR. Dopovidi, no. 10, 1964, 1277-1280

TOPIC TAGS: function theory

Abstract: It is shown that in order to make the p-harmonic function $u = u(x, y)$ with characteristic $p = p(x, y)$ representable in the form of a linear combination of the harmonic function $U = U(x, y)$ and its derivatives to the nth order

$$u = \sum_{k=1}^{n} \alpha_k \frac{\partial^k U}{\partial x^k} + \delta_k \frac{\partial^k U}{\partial x^{k-1} \partial y},$$

[$U = U(x, y)$ is an harmonic function of x, y, and α_k, δ_k ($k = 1, 2, \ldots, n$) are functions of x and y], it is necessary and sufficient that the characteristic $p = p(x, y)$ satisfy the condition $\Omega_1 = 0$ [Ω is

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a function of x and y7 and, in particular, (with n = 1, 2, 3) the following three conditions:

$$\Delta\sqrt{P} = 0 \quad \left(\Delta = \frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right), \quad \frac{d^2 \ln Q}{dz d\bar{z}} + Q = 0, \quad (Q = P/4), \text{ and}$$

$$\frac{d}{dz}\,\frac{3\frac{dQ}{dz} + \frac{d^2 \ln Q}{dz d\bar{z}}\int Q d\bar{z} + \frac{d}{d\bar{z}}\left(\frac{1}{Q}\frac{d^2Q}{dz^2}\right) + Q\int Q d\bar{z}}{\frac{d^2 \ln Q}{dz d\bar{z}} + Q} = 0.$$

Orig. art. has 17 formulas.

ASSOCIATION: Kyyivs'kyy derzhavnyy universytet (Kiev State University)

SUBMITTED: 03Dec63 ENCL: 00 SUB CODE: MA

NO REF SOV: 001 OTHER: 000 JPRS

Card 2/2

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N. (Kiyev)

Limiting values and conversion formulae along the sections of the fundamental integral representation of p-analytic functions with the characteristic $p = x^k$. Part 1. Ukr. mat. zhur. 16 no.5:631-656 '64. (MIRA 17:10)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

L 35586-65 EWT(d)/T/EWP(1) IJP(c)

ACCESSION NR: AP5006988 S/0198/65/001/001/0039/0051

17

AUTHORS: Polozhiy, G. N. (Kiev); Ulitko, A. F. (Kiev) 16

B

TITLE: On inversion formulae for fundamental integral representations of p-analytic functions with characteristics $p = x^k$

16

SOURCE: Prikladnaya mekhanika, v. 1, no. 1, 1965, 39-51

TOPIC TAGS: analytic function, complex variable, integral operator

ABSTRACT: Let G and G_1 be domains in the right half-plane $z = x + iy$, where G has the imaginary axis L as its bound and G_1 contains some branch L_1 going to infinity, parallel to the real axis; $k = \text{const} > 0$; Ω - is the region consisting of the domain G and its mirror image relative to the imaginary axis. Let M and M_1 be a set of functions analytic in the domains G and G_1, respectively, and if $f(z) \subset M$, then when approaching infinity $|f(z)| = O(|z|^{-k-\varepsilon})$, where ε is a positive number. As in previous works by the senior author (Zamitka do osnovnogo integral'nogo predstavlennya p-analitichnikh funktsiy z kharakteristikoyu $p = x^k$, DAN URSR, No. 7, 1964), the following x^k-analytic integral representations exist

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ACCESSION NR: AP5006988

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in mathematical physics $P(f)=\frac{1}{2}\int_{\Gamma} f(\zeta)\left[\left(\frac{z+\bar{z}}{2}\right)^{1-k}+\zeta-\frac{z-\bar{z}}{2}\right](z-\zeta)^{\frac{k}{2}-1}(\bar{z}+\zeta)^{\frac{k}{2}-1}d\zeta,$

where the Γ -contour in Ω joins the points $-\bar{z}=-x+iy$ with the points $z=x+iy,\ \zeta=\xi+i\eta\subset\Gamma,\ f(z)\subset M;$ and

$$P_1(f)=\mathrm{Re}\int_{\Gamma} f(\zeta)\left(\frac{z+\bar{z}}{2}\right)^{1-k}(z-\zeta)^{\frac{k}{2}-1}(\bar{z}+\zeta)^{\frac{k}{2}-1}d\zeta+ \\ +i\,\mathrm{Im}\int_{\Gamma} f(\zeta)\left(\zeta-\frac{z-\bar{z}}{2}\right)(z-\zeta)^{\frac{k}{2}-1}(\bar{z}+\zeta)^{\frac{k}{2}-1}d\zeta,$$

where Γ - is the contour in G_1 which joins the point at infinity with $\bar{z}=x+iy,\ \zeta=\xi+i\eta\subset\Gamma,\ f(z)\subset M_1.$ It is shown that inversion formulae for these integral operators exist not only when Γ coincides with a straight line branch but in many other cases also, such as: formulae in spherical coordinates where Γ is the contour $\zeta=\rho e^{i\left(\frac{\pi}{2}-\varphi\right)}$ $(\rho=\mathrm{const},\ 0<\varphi<\theta)$ and where k may or may not be a

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ACCESSION NR: AP5006988

whole even number; formulae in bi-spherical coordinates and toroidal coordinates corresponding to the real domain; and inversion formulae in Cartesian coordinates over an infinite integration range both in the real and imaginary domain. Orig. art. has: 47 equations and 1 figure.

ASSOCIATION: Kiyevskiy gosuniversitet--Institut mekhaniki AN UkrSSR (Kiev State University--Institute of Mechanics, AN UkrSSR)

SUBMITTED: 10Sep64 ENCL: 00 SUB CODE: MA

NO REF SOV: 005 OTHER: 001

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N.; SKOROBOGAT'KO, A.A.

A class of formulae of summary representations. Vych. mat. [Kiev] no. 1:20-40 '65 (MIRA 19:2)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

ACC NR: AR6033848 SOURCE CODE: UR/0044/66/000/007/B093/B093

AUTHOR: Polozhiy, G. M.; Prykhod'ko, O. M.

TITLE: Modification of summary representation formulas

SOURCE: Ref. zh. Matematika, Abs. 7B505

REF SOURCE: Visnyk. Kyyivs'k. untu. Ser. matem. ta mekhan., no. 7, 1965, 3-15

TOPIC TAGS: elliptic differential equation, second order differential equation, Dirichlet problem

ABSTRACT: Modified formulas of summary representations (RZhMat, 1963, 1V20) are derived for second-order elliptic differential equations with constant coefficients and for a biharmonic equation in the case of a rectangular integration region. These formulas represent the solution of corresponding partial finite-difference equations in the middle of a rectangle in terms of the boundary conditions on its horizontal sides and some unknown parameters which are determined in terms of boundary conditions on the vertical sides of the rectangle. For the

UDC: 518:517.944/.947

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equation

$$\Delta_h u - 2\lambda u = f(x_i, y_k),$$

where $\Delta_h u$ is the five-point finite-difference Laplace operator, λ is the numerical parameter and f(x, y) is the function defined in the internal points of the rectangle, summary representation formulas which give the solution of the following problems for the rectangular region have been derived: 1) Dirichlet problems; 2) the horizontal sides of the rectangle show the values of u, and the verticle sides, the differences between the values of u adjacent to the outside and inside of the contour of a region; 3) the horizontal and left vertical sides of the rectangle show the values of u, and the left vertical side, the differences between the values u adjacent to the outside and inside of contours of a region; 4) the right vertical side shows the differences between the values of u adjacent to the outside and inside of the contour of a region, and the left vertical and horizontal sides of the rectangle, the values of function u. For the finite-difference biharmonic equation

$$\Delta_h \Delta_h u = f(x_i, y_k),$$

where the biharmonic finite-difference operator is constructed from thirteen points of the net, summary representation formulas are derived providing the solution of the following problems for a rectangular region of integration: 1) when values of u and sums of the values of u adjacent to the outside and inside of the

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contours of the region are given on the horizontal sides of the rectangle, and the values of u and the differences of u adjacent to the outside and inside of the contour are given on the vertical sides; 2) contour values and sums of u adjacent to the outside and inside of the contour are given on all the sides of the rectangla; 3) contour values and differences of u adjacent to the outside and inside of the contour are given on the left vertical side of the rectangle, while contour values and sums of u adjacent to the outside and inside of the contour are given on the remaining three sides; 4) values of function u and differences of function u adjacent to the outside and inside of the contour are given on the right vertical side of the rectangle, while values of u and the sums of u adjacent to the outside and inside of the contour are given on the three remaining sides of the rectangle. N. Lyashchenko. [Translation of abstract] [DW]

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

ACC NR: AR6027470 SOURCE CODE: UR/0044/66/000/005/B102/B102

AUTHOR: Polozhiy, G. N.; Skorobagat'ko, A. A.

TITLE: A class of formulas for series representation

SOURCE: Ref. zh. Matematika, Abs. 5B538

REF SOURCE: Vychisl. matematika. Mezhved. nauchn. sb., vyp. 1, 1965, 20-40

TOPIC TAGS: differential equation, boundary value problem, numeric method, Poisson equation

ABSTRACT: A class of formulas for series representations has been established which is extremely convenient for the numerical solution of numerous boundary problems connected with the two-dimensional Poisson equation. The formula for the series representation for the equations 16

$$\Delta_{\sigma\tau}V-2\lambda\rho^{-2}V=\rho^{-2}F(\rho,\vartheta), \quad (1)$$

has been obtained with λ - a real constant,

$$\rho=\sqrt{\sigma^2+\tau^2}, \quad \vartheta=\operatorname{arctg}\frac{\tau}{\sigma}$$

for the annular sector (disregarding its angular points). The case when the annular sector is degenerated into a ring is also investigated. Formulas are established for

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35
BH

Polozhiy, Georgiy Nikolayevich

Generalization of the theory of analytic functions of a complex variable; p-analytic and (p, q) analytic functions and some of their applications (Obobshcheniye teorii analiticheskikh funktsiy kompleksnogo peremennogo; p-analiticheskiye i (p, q) analiticheskiye funktsii i nekotoryye ikh primeneniya) Kiev, Izd-vo Kiyevskogo univ., 65. 0441 p. illus., biblio. 4,200 copies printed.

TOPIC TAGS: mathematics, mathematic analysis, non linear theory, analysity, mathematic logic, function theory, analytic function, continuous function, algebra

PURPOSE AND COVERAGE: This book presents the author's research on establishing the general theory, and some applications of p-analytic and (p,q) analytic functions of complex variable as one of the closest analog of analytic variable. This book is intended for students at mathematic institutes of higher learning, and physics faculties, universities, for candidates, scientists as well as engineers.

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

L 33432-66 EWT(d) IJP(c)

ACC NR: AT6010210 SOURCE CODE: UR/3187/65/000/001/0020/0040

AUTHOR: Polozhiy, G.N.; Skorobogat'ko, A.A.

28

B+1

ORG: None

TITLE: On a class of summary represetations formulas

SOURCE: Kiyev. Universitet. Kafedra vychislitel'noy matematiki. Vychislitel'naya matematika, no. 1, 1965, 20-40

TOPIC TAGS: partial differential equation, Poisson equation, numeric solution, finite difference, summary representation method

ABSTRACT: This paper develops a class of summary representations formulas, useful for the solution of boundary value problems related to the Poisson partial differential equation. The authors extend previous cited work of one of them (G.N. Polozhiy), related to boundary problems of mathematical physics, including elliptic differential equations. The starting point is the derivation of the formulas for a ring sector and a ring for the two-dimensional Poisson equation

$$\Delta_{\sigma\tau}V - 2\lambda\varrho^{-2}V = \varrho^{-4}F(\varrho,\theta) \quad \left(\Delta_{\sigma\tau} = \frac{\partial^2}{\partial\sigma^2} + \frac{\partial^2}{\partial\tau^2}\right). \quad (1)$$

where λ - a real constant, $\rho = \sqrt{\sigma^2 + \tau^2}$, ϑ = arctg τ/σ. After a transformation to $x = \ln\rho$, $y = \vartheta$, and passage to the equivalent difference equation (2)

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ACC NR: AP6014212 SOURCE CODE: UR/0198/66/002/004/0001/0006

31

B

AUTHOR: Poloshiy, G. N. (Kiev)

ORG: Kiev State University (Kievskiy gosudarstvennyy universitet)

TITLE: A modification of the formula of total representations for the generalized biharmonic equation equation

SOURCE: Prikladnaya mekhanika, v. 2, no. 4, 1966, 1-6

TOPIC TAGS: Tschebyschev polynomial, difference equation, mathematic matrix, matrix element, vector, eigenvalue

ABSTRACT: The problem of representing the general solution of a finite-difference generalized biharmonic equation in terms of its pre-boundary and post-boundary values is examined. The formula for total representations for the generalized biharmonic equation

$$\Delta\Delta U - 2a\Delta U - 2\lambda U = f(x, y), \quad \left(\Delta = \frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right),$$

for a rectangle was established earlier by G. M. Polozhiy (Pro skinchenni spivvidnoshennya dlya rivnyan' v chastinnikh skinchennikh riznitsyakh, Visnik Kiivs'kogo un-tu, No. 3, Seriya matematiki ta mekhaniki, V. 1, 1960). The equation is modified and written in the form of partial finite differences:

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

(N) L 30995-66 EWT(d) IJP(c)

ACC NR: AP6002332 SOURCE CODE: UR/0198/65/001/012/0001/0008

34
B

AUTHOR: Polozhiy, G. N. (Kiev)

ORG: Kiev State University (Kiyevskiy gosudarstvennyy universitet)

16,44,55

TITLE: Solution of fundamental biharmonic problem for a wide class of regions using the method of integrated representation

SOURCE: Prikladnaya mekhanika, v. 1, no. 12, 1965, 1-8

TOPIC TAGS: mathematic method, conformal mapping, complex function, algebraic equation, partial differential equation

ABSTRACT: The solution of the basic biharmonic equation

$$\Delta\Delta\Phi = 0; \qquad \Lambda = \frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2};$$

$$\Phi\Big|_L = \chi(s); \qquad \frac{\partial\Phi}{\partial n}\Big|_L = \chi_1(s)$$

for any simply- or doubly-connected region G with piecewise continuous boundaries is analyzed. For a simply-connected region, the general solution of the biharmonic

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equation in the x, y plane is given by

$$\Phi = (r^2 - \varrho_0^2)U + V.$$

The solution is then mapped onto the ζ -plane

$$\varrho = \varrho_j = e^{t_0 + jh}; \qquad (j = \ldots, -2, -1, 0);$$

$$\vartheta = \vartheta_k = kh_1; \qquad (k = 1, 2, \ldots, n)$$

as a circle leading to the integrated representation

$$\vec{\varphi}(r_j) = (R^2(j) - \varrho_0^2 E)P_7\Phi(j)\vec{A} + P_7\Phi(j)\vec{B};$$

$$(j = \ldots, -2, -1, 0)$$

whose vectors $\bar{A}$ and $\bar{B}$ are determined from a set of 2n linear algebraic equations

$$P_7^*(R^2(0) - \varrho_0^2 E)P_7\vec{A} + \vec{B} = P_7^*\vec{\varphi}(r_0);$$

$$\Phi^{-1}(-1)P_7^*(R^2(-1) - \varrho_0^2 E)P_7\Phi(-1)\vec{A} + \vec{B} = \Phi^{-1}(-1)P_7^*\vec{\varphi}(r_{-1}).$$

Similarily, when G is a doubly-connected region, the general solution of the biharmonic equation is given by $\Phi = (r^2 - \varrho_0^2)U + (\varrho_{m+1}^2 - r^2)V$

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with the corresponding integrated representation

$$\vec{\varphi}(r_j) = [R^2(j) - \varrho_0^2 E] P_7 [\Phi(m+1-j)\vec{A} + \overline{S}(m+1-j)\vec{A}^*] +$$
$$+ [\varrho_{m+1}^2 E - R^2(j)] P_7 [\Phi(j)\vec{B} + \overline{S}(j)\vec{B}^*]; \quad (j = 0, 1, \ldots, m+1)$$

where the n-dimensional vectors $\overline{A}$, $\overline{A}*$, $\overline{B}$, $\overline{B}*$ are determined from a set of 4n linear algebraic equations. Orig. art. has: 38 equations and 2 figures.

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POLOZHIY, G.N. (Kiyev)

Solution of the basic biharmonic problem for a wide range of areas by the method of summary representations. Prikl. mekh. 1 no.12:1-8 '65. (MIRA 19:1)

1. Kiyevskiy gosudarstvennyy universitet. Submitted June 23, 1965.

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N.; CHALENKO, P.I.

Solution of integral equations by the method of strips. Vop. mat. fiz. i teor. funk. no.1:124-144 '64. (MIRA 18:2)

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MITROPOL'SKIY, Yu.A., otv. red.; BEREZANSKIY, Yu.M., red.; BREUS, K.A., red.; ZMOROVICH, V.A., red.; LYASHKO, I.I., red.; MARCHENKO, V.A., red.; PARASYUK, O.S., red.; POLOZHIY, G.N., red.; FIL'CHAKOV, P.F., red.; KULAKOVSKAYA, N.S., red.

[Mathematical physics] Matematicheskaia fizika. Kiev, Naukova dumka, 1965. 156 p. (MIRA 18:8)

1. Akademiya nauk URSR, Kiev.

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N.

Representation of p-analytic functions in the form of linear combinations of analytic functions and their first and second derivatives. Sib. mat. zhur. 5 no.6:1226-1232 N-D '64. (MIRA 17:12)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, Georgiy Nikolayevich; TAL'SKIY, D.A., red.

[Equations in mathematical physics] Uravneniia matematicheskoi fiziki. Moskva, Vysshaia shkola, 1964. 559 p. (MIRA 17:10)

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ACCESSION NR: AP4043721 S/0021/64/000/008/0986/0991

AUTHOR: Polozhiy, G. M (Polozhiy, G. N.)

B

TITLE: Representation of p-analytic functions in terms of analytic functions and their derivatives

SOURCE: AN UkrRSR. Dopovidi, no. 8, 1964, 986-991

TOPIC TAGS: p analytic function, p analytic function representation, analytic function, linear homogeneous equation

ABSTRACT: The representation of the p-analytic function

$$w = f(z) = u(x, y) + iv(x, y)$$

with the characteristic p(x,y) in terms of the analytic function

$$F(z) = \frac{\partial U}{\partial x} - i\frac{\partial U}{\partial y},$$

where U is a real function, is sought in the form

$$w = \left|\sum_{k=1}^{n} \omega_k \frac{\partial^k U}{\partial x^k} + \omega_k \frac{\partial^k U}{\partial x^{k-1}\partial y}\right|, \qquad (1)$$

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ACCESSION NR: AP4043721

where the integer $n \geq 2$. The necessary condition which the characteristic $p(x,y)$ must satisfy in order to make representation (1) possible is derived in the form of a differential equation. Because this equation is linear and homogeneous with respect to certain analytic functions $C_n, C_{n-1}, \ldots, C_2$ and their derivatives (up to a certain order), a nontrivial solution exists and the representation of p-analytic functions in form (1) can be derived. Orig. art. has: 22 formulas.

ASSOCIATION: Kiyevskiy gosudarstvenny*y universitet (Kiev State University)

SUBMITTED: 28Nov63 ATD PRESS: 3106 ENCL: 00

SUB CODE: MA NO REF SOV: 003 OTHER: 000

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N. [Polozhii, H.M.]

Representation of p-harmonic functions by harmonic functions and their derivatives. Dop. AN URSR no.10:1277-1280 '64.
(MIRA 17:12)

1. Kiyevskiy gosudarstvennyy universitet. Predstavleno akademikom AN UkrSSR I.Z. Shtokalo.

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N. [Polozhii, H.M.]

Representation of p-analytic functions by analytic functions and their derivatives. Dop. AN URSR no.8:986-991 '64. (MIRA 17:8)

1. Kiyevskiy gosudarstvennyy universitet. Predstavleno akademikom AN UkrSSR Yu.A. Mitropol'skim [Mytropol's'kyi, IU.O.].

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

ACCESSION NR: AP4026836 S/0041/64/016/002/0254/0259

AUTHOR: Poloshiy, G. N. (Kiev)

TITLE: Basic integral representation of p-analytic functions with characteristic p equals x to the k [Abstracter's note: x^k would have another meaning not appropriate here]

SOURCE: Ukrainskiy matematicheskiy zhurnal, v. 16, no. 2, 1964, 254-259

TOPIC TAGS: integral representation, analytic function, generalized derivative, integral transformation, symmetric contour, closed contour

ABSTRACT: Let G be a region in the right half plane z = x + iy, G* be a region symmetric to it with respect to the imaginary axis, k = const > 0. The author establishes conditions under which various types of integral representations of functions will be x^k-analytic. This is an extension of his previous work (Pro odne integral'ne peretvoreniya uzagal'nenikh analitichnikh funktsiy, Visnik KDU, ser. astr., matem. ta mekh., No. 2, vip. 1, 1959 and O krayevykh zadachakh osesimmetrichnoy teorii uprugosti. Metod p-analiticheskikh funktsiy kompleksnogo peremonnogo, Ukr. matem. zh., t. XI, No. 1, 1963). A typical theorem is Theorem

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1: If G contains in its boundary an interval L of the imaginary axis and $f(z) = u(x,y) + iv(x,y)$ is a function which is analytic in G such that $v|_L = 0$, then the function

$$\tilde{f}(z) = \tilde{u}(x, y) + i\tilde{v}(x, y) = \frac{1}{2}\int_{\Gamma} f(z)\left[\left(\frac{z+\bar{z}}{2}\right)^{1-k} + \zeta - \frac{z-\bar{z}}{2}\right] \times$$
$$\times (z-\zeta)^{\frac{k}{2}-1}(\bar{z}+\zeta)^{\frac{k}{2}-1}d\zeta, \qquad (1)$$

where Γ is the contour in the region $G + G^*$ joining the point $-\bar{z} = -x + iy$ with the point $z = x + iy$ (intersecting L), will be an x^k-analytic function in the region G, and will have, on L, continuous derivatives in x and y and $\tilde{v}|_L = 0$. The integral transformation (1) establishes a one to one correspondence between x^k-analytic and analytic functions in the region G, whose imaginary parts on L are equal to zero. Orig. art. has: 12 formulas.

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N.

Boundary value problems in the axisymmetrical theory of elasticity. Method of p-analytical functions of complex variables. Ukr. mat. zhur. 15 no.1:25-45 '63. (MIRA 16:3)

(Elasticity)

(Functions of complex variables--Problems, exercises, etc.)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N. [Polozhii, H.M.]

Remarks on the fundamental integral representation of p-analytic functions with the characteristic $p = x^k$. Dop. AN URSR no.7:839-841 '64. (MIRA 17:9)

1. Kiyevskiy gosudarstvennyy universitet. Predstavleno akademikom AN UkrSSR G.N.Savinym [Savin, H.M.].

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N.

AID Nr. 975-12 23 May

BOUNDARY VALUE PROBLEMS IN AXISYMMETRIC ELASTICITY THEORY (USSR)

Polozhiy, G. N. Ukrainskiy matematicheskiy zhurnal, v. 15, no. 1, 1963, 25-45. S/041/63/015/001/002/009

A new method for solving the axisymmetric problems of the theory of elasticity, based on the application of p-analytic functions, is presented. It is proven that for p-analytic functions in a domain of sufficiently general form, an integral operator transforming these functions into analytic functions of a complex variable can be constructed. For general statics equations of the elastic body, written in terms of displacements, general solutions of the axisymmetric theory of elasticity based on the author's earlier work are derived which reduce the stress distribution problem to the solution of the corresponding boundary value problem for p-analytic functions. After various transformations, the general solution is expressed in terms of two r-harmonic functions. An integral operator is constructed and formulas are derived which make it possible to reduce the axisymmetric elasticity theory problems to plane elasticity theory problems, permitting the solution of boundary value problems for analytic functions. It is shown that the p-analytic function method leads to a simple solution in quadratures of the basic problem of axisymmetric elasticity theory for a three-dimensional layer. [LK]

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

S/044/63/000/002/011/050
A060/A126

AUTHOR: Polozhiy, G.N.

TITLE: On (p, q)-analytic functions of a complex variable and some of their applications

PERIODICAL: Referativnyy zhurnal, Matematika, no. 2, 1963, 35, abstract 2B147 (In collection "Issled. po sovrem. probl. teorii funktsiy kompleksn. peremennogo", Moscow, Fizmatgiz, 1960, 483 - 515)

TEXT: In a simply connected domain G of the plane of the complex variable $z = x + iy$ let there be given real continuous functions $p(x, y)$ and $q(x, y)$, where $p > 0$. The function $f(z) = u(x, y) + iv(x, y)$ the author calls (p, q)-analytic in the domain G if in G it is single-valued, and its real and imaginary parts are continuously differentiable and satisfy the system of equations

$$p u_x + q \cdot u_y - v_y = 0, \quad -q \cdot u_x + p \cdot u_y + v_x = 0, \tag{1}$$

For $q = 0$ the (p, q)-analytic function is called a p-analytic function. The

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

S/044/63/000/002/011/050
On (p, q)-analytic functions of a complex A060/A126

class of p-analytic functions is dealt with in a series of the author's previously published papers. The author considers it expedient to particularly distinguish three classes of generalized analytic functions: 1) p-analytic functions; 2) (p, q)-analytic functions; and 3) functions satisfying the system of equations

$$U_x - V_y = \alpha U + \beta \cdot V, \; U_y + V_x = \gamma \cdot U + \delta V, \tag{2}$$

where α, β, γ, δ are specified functions of x, y. By means of simple transformations it is easy to reduce the solution of any linear homogeneous elliptic system to the solution of system (2). The functions $Z = X + iY$ and $\tilde{Z} = \tilde{X} + i\tilde{Y}$ are called by the author the conjugate variables (in the domain G) corresponding to the characteristics p and q, if the functions $Z^* = X + i\tilde{Y}$ and $\tilde{Z}^* = -Y + i\tilde{X}$ are in G twice-differentiable (p, q)-analytic functions. The integral with respect to the conjugate variables of the (p, q)-analytic function $f(z) = u(x, y) + iv(x, y)$ one calls the expression

$$\Phi(z) = \int_{z_0}^{z} f(z)\,dz = \int_{z_0}^{z} u \cdot d\tilde{Z} + iv dZ = \int_{z_0}^{z} u \cdot d\tilde{X} - v dY + i \int_{z_0}^{z} v \cdot dX + u d\tilde{Y}$$

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(where z_0 is a fixed point, z is a variable point). It is noted that (in the presence of an additional condition) the integral with respect to the conjugate variable $\Phi(z)$ is independent of the path of integration connecting the points z_0 and z. It represents a generalization of the $\sum$-integral considered by L. Bers, A. Gelbart and others. In terms of the integral with respect to conjugate variables the author formulates for (p, q)-analytic functions an analog of the Cauchy theorem and gives an analog to Cauchy's integral formula. In order for an integral $\Phi(z)$ with respect to conjugate variables of an arbitrary (p, q)-analytic function to be itself a (p, q)-analytic function, it is necessary and sufficient that either of the following two conditions be satisfied: a) that $\tilde{Z} = \tilde{X} + i\tilde{Y}$ and $-i\,Z = Y - iX$ be (p, q)-analytic functions; b) that the characteristics p and q are functions of some harmonic function $\beta(x, y)$ ($p = p(\beta)$, $q = q(\beta)$). Let there exist an analytic function $\alpha(x, y) + i\beta(x, y)$ (α and β real) such that p and q are functions of $\beta(x, y)$ only; let $p^* = p/(p^2 + q^2)$. The formal (p, q)-derivatives with respect to z and $\bar{z}$ of the function $f(z) = u + iv$ (not necessarily (p, q)-analytic) are defined by the sequence of formulae:

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$$
\begin{aligned}
\frac{'df}{dz} &= \frac{1}{2}\left(\frac{\partial u}{\partial \alpha} - \frac{q}{p}\frac{\partial u}{\partial \beta} + \frac{1}{p}\frac{\partial v}{\partial \beta}\right) + i\,\frac{1}{2}\left(\frac{\partial v}{\partial \alpha} + \frac{q}{p}\frac{\partial v}{\partial \beta} - \frac{1}{p^2}\frac{\partial u}{\partial \beta}\right), \\
\frac{'df}{d\bar{z}} &= \frac{1}{2}\left(\frac{\partial u}{\partial \alpha} + \frac{q}{p}\frac{\partial u}{\partial \beta} - \frac{1}{p}\frac{\partial v}{\partial \beta}\right) + i\,\frac{1}{2}\left(\frac{\partial v}{\partial \alpha} - \frac{q}{p}\frac{\partial v}{\partial \beta} + \frac{1}{p^2}\frac{\partial u}{\partial \beta}\right).
\end{aligned}
\tag{3}
$$

The condition for (p, q)-analyticity of the function $f(z)$ (the analog to the Cauchy-Rieman criterion) is written thus:

$$\frac{'df}{d\bar{z}} = 0 .$$

If $f(z)$ is a (p, q)-analytic function, then also its (p, q)-derivative (3) is a (p, q)-analytic function. It is possible to consider differential equations with (p, q)-derivatives, and with their aid to introduce elementary (p, q)-analytic functions (for example, the (p, q) analogs of the functions e^z, $\sin z$, z^n). The author dwells upon such a possibility for the case of p-analytic functions (i.e., when $q \equiv 0$). He notes that other properties of (p, q)-analytic functions, analogous to the properties established by him in other works for p-analytic functions may be derived from the results of I.N. Vekua for the solutions of

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On (p, q)-analytic functions of a complex ....

equations of the form

$$\frac{\partial F}{\partial \bar{z}} = a \cdot F + b \cdot \overline{F}.$$

The possibility is clarified of applying (p, q)-analytic functions (in particular, p-analytic functions) to problems of mechanics of continuous media (the axially-symmetric problem of the theory of elasticity, filtration problems in homogeneous and inhomogeneous media, and others). Certain results of an exemplary nature are set forth, belonging to the author and his students. There are 57 references.

M.B. Balk

[Abstracter's note: Complete translation]

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SOV/6094

PHASE I BOOK EXPLOITATION

Polozhiy, G. N.

Chislennoye resheniye dvumernykh i trekhmernykh krayevykh zadach matematicheskoy fiziki i funktsii diskretnogo argumenta (Numerical Solutions of Two-Dimensional and Three-Dimensional Boundary-Value Problems in Mathematical Physics and Discrete Argument Functions). [Kiyev] Izd-vo Kiyevskogo universiteta, 1962. 160 p. 4500 copies printed.

Sponsoring Agency: Ministerstvo vysshego i srednego spetsial'nogo obrazovaniya SSSR. Kiyevskiy ordena Lenina gosudarstvennyy universitet imeni T. G. Shevchenko.

Ed.: V. P. Rizhko; Tech. Ed.: M. M. Zagnitko.

PURPOSE: This book may be useful to scientific workers and engineers interested in the numerical solution of problems in mathematical physics and engineering, particularly in cases where high requirements are made regarding the accuracy of the approximate solutions.

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POLOZHIY, G.N. [Polozhii, H.M.] (Kiyev); KIYASHKO, A.M. [Kiiashko, A.M.] (Kiyev)

Applying p-analytic functions to the solution of boundary problems in the zero-torque shell theory. Prykl.mekh. 7 no.4:364-369 '61. (MIRA 14:9)

1. Kiyevskiy gosudarstvennyy universitet.
(Elastic plates and shells)
(Functions, Analytic)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N. [Polozhii, H.M.]; CHALENKO, P.I.

Method of strips for solving integral equations. Dop. AN URSR no.4:427-431 '62. (MIRA 15:5)

1. Kiyevskiy gosudarstvennyy universitet. Predstavleno akademikom AN USSR I.Z.Shtokalo.

(Integral equations)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

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B156/B112

AUTHORS: Polozhiy, G. N., Chemeris, V. S.

TITLE: Integral equations in the axisymmetric theory of elasticity

PERIODICAL: Referativnyy zhurnal. Matematika, no. 6, 1962, 87, abstract 6B361 (Sb. "Issled. po sovrem. probl. teorii funktsiy kompleksn. peremennogo". M., Fizmatgiz, 1961, 399-412)

TEXT: Integral equations are compiled for the axisymmetric theory of elasticity. The initial equations are those produced by G. N. Polozhiy, which express solutions to the differential equations for an axisymmetric problem using two p-analytic functions (solution of an elliptical system of two first-order equations). On the basis of these equations, the second boundary problem in the theory of elasticity is reduced to a boundary problem for p-analytic functions. Using the generalized Cauchy equations for p-analytic functions, the authors obtain two different forms of integral equation for the p-analytic functions required. An explicit expression is obtained for the kernels of the equations by using complete elliptical integrals. [Abstracter's note: Complete translation.] B

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POLOZHIY, G.N. [Polozhii, H.M.] (Kiyev); KAPSHIVYY, A.A. [Kapshyvyi, O.O.] (Kiyev)

Solution of axisymmetrical problems in the theory of elasticity for a finite cylinder. Prykl.mekh. 7 no.6:616-626 '61. (MIRA 14:11)

1. Kiyevskiy gosudarstvennyy universitet.
(Elastic plates and shells—Vibration)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N.; RIZHKO, V.P., red.; ZAGNITKO, M.M., tekhn. red.

[Numerical solution of two-dimensional and three-dimensional boundary value problems in mathematical physics and functions of discrete arguments] Chislennoe reshenie dvumernykh i trekhmernykh kraevykh zadach matematicheskoi fiziki i funktsii diskretnogo argumenta. Kiev, Izd-vo Kievskogo univ., 1962. 160 p. (MIRA 15:7)

(Boundary value problems) (Functions)
(Mathematical physics)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N. (Kiyev)

Fundamental integral representation of p-analytic functions with the characteristic $p = x^k$. Ukr. mat. zhur. 16 no.2:254-259 '64. (MIRA 17:3)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N. [Polozhii, H.M.]

A new method for the numerical solution of a boundary problem for elliptical differential equations with partial derivatives. Dop. AN URSR no. 12:1579-1583 '60. (MIRA 14:1)

1. Kiyevskiy gosudarstvennyy universitet. Predstavleno akademikom AN USSR I.Z. Shtokalo.
(Differential equations, Partial)

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N.

New method of a numerical solution of boundary value problems for elliptic differential equations [with summary in English]. Ukr. mat. zhur. 12 no.3:308-323 '60. (MIRA 13:11)
(Differential equations, Partial) (Boundary value problems)

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AUTHOR: Polozhiy, G.N.

TITLE: On a New Method for the Numerical Solution of Boundary Value Problems for Elliptic Differential Equations

PERIODICAL: Ukrainskiy matematicheskiy zhurnal, 1960, Vol. 12, No. 3, pp. 308 - 323

TEXT: In general many linear algebraic equations must be solved for approximate solutions of boundary value problems for elliptic differential equations by reduction to difference equations. In the present paper the author gives special formulas for some difference operators with the aid of which the solutions of the corresponding algebraic systems can be written very simple, or these systems can be reduced to systems with a small number of equations.
The author uses the net $x_i = x_0 + ih$, $y_k = y_0 + kh_1$ $(i,k = 0, \pm 1, \pm 2, ..)$.
If $\frac{h}{h_1} = \alpha_1$ then the difference operator of Laplace $\Delta_h u$ can be written in the form

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On a New Method for the Numerical Solution of Boundary Value Problems for Elliptic Differential Equations

(1) $$\Delta_h u = \frac{1}{h^2} \begin{array}{|c|c|c|} \hline & \alpha^2 & \\ \hline 1 & -2(1+\alpha^2) & 1 \\ \hline & \alpha^2 & \\ \hline \end{array} \; u. \qquad (1)$$

The rectangle D denotes the totality of the points-knots (x_i, y_k), where $i = 0,1,\dots,m+1$; $k = 0,1,\dots, n+1$. Let

(3) $u_k(x) = u(x,y_k)$, $f_k(x) = f(x,y_k)$ $(k = 0 \pm 1 \dots)$

(4) $\vec{u}(x) = \{u_k(x)\}_1^n$, $\vec{f}(x) = \{f_k(x)\}_1^n$

(5) $\vec{\omega}(x) = \{u_o(x),0,\dots,0, u_{n+1}(x)\}$

(6) $a = 1 + \alpha^2 + h^2\lambda$, $\lambda_k = \cos k\beta$, $\beta = \frac{\pi}{n+1}$ $(k = 1,2,\dots n)$

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On a New Method for the Numerical Solution of Boundary Value Problems for Elliptic Differential Equations

Furthermore let the matrix of n-th order be introduced :

(7) $$S = \sqrt{\frac{2}{n+1}}\,\left(\left((-1)^{i+n} \sin ik\beta\right)\right)_1^n$$

Theorem 1 : For the general solution of the difference equation

(8) $$\Delta_h u - 2\lambda u = f(x,y) \qquad (\lambda^2 = \text{const} > 0)$$

in D (with an exception of the points (x_o, y_o), (x_{m+1}, y_o), (x_{m+1}, y_{n+1}), (x_o, y_{n+1})) there holds the relation

(9) $$\vec{u}(x_i) = S\vec{A}(x_i) + S\vec{B}(x_i) + S\vec{\Omega}(x_i) \qquad (i = 0, 1, \ldots, m+1)$$

where $\vec{A}(x_i)$, $\vec{B}(x_i)$, $\vec{\Omega}(x_i)$ are n-dimensional vectors :

(10) $$\vec{A}(x_i) = \left\{A_k \quad {}_k(x_i)\right\}_1^n, \quad \vec{B}(x_i) = \left\{B_k \Psi_k(x_i)\right\}_1^n,$$

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On a New Method for the Numerical Solution of Boundary Value Problems for Elliptic Differential Equations

(11) $\vec{\Omega}(x_i) = \left\{\Omega_k(x)\right\}_1^n - \sum_{p=1}^{p=i-1} T(i-p)S\left[h^2\vec{f}(x_p) - \alpha^2\vec{\omega}(x_p)\right]$,

(11') $\vec{\Omega}(x_o) = \vec{\Omega}(x_1) = 0$

A_k, B_k are arbitrary real constants while $\varphi_k(x_i)$, $\Psi_k(x_i)$ and the diagonal matrix

(12) $T(i) = ((T_k(i)))_1^n$

in dependence of

(13) $\eta_k = a + \lambda_k \alpha^2$ $(k = 1,2,\ldots,n)$

are given by the table 1

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On a New Method for the Numerical Solution of Boundary Value Problems for Elliptic Differential Equations S/041/60/012/003/005/011 C111/C222

table 1

	$\varphi_k(x_l)$	$\psi_k(x_l)$	$T_k(l)$	
$\lvert\eta_k\rvert > 1$	μ_k^l	ν_k^l	$(\mu_k^l - \nu_k^l)(\mu_k - \nu_k)^{-1}$	$\mu_k = \eta_k + \sqrt{\eta_k^2 - 1}$
$\lvert\eta_k\rvert = 1$	μ_k^l	$l\mu_k^l$	$l\mu_k^{l-1}$	$\nu_k = \eta_k - \sqrt{\eta_k^2 - 1}$
$\lvert\eta_k\rvert < 1$	$\cos l\theta_k$	$\sin l\theta_k$	$\sin l\theta_k(\sin\theta_k)^{-1}$	$\theta_k = \arc\cos\eta_k$

The formula (9) is used for solving the Dirichlet problem

(24) $\Delta U - 2\lambda U = f(x,y)$

(25) $U|_L = \beta(s)$,

where $\beta(s)$ is a given function of the arc s of the boundary L of a region G which either is identical with D or consists of two rectangles D and D' joined together or is an arbitrary region. Here the approximate solution is sought as a solution of the difference problem

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On a New Method for the Numerical Solution of Boundary Value Problems for Elliptic Differential Equations

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(8) $$\Delta_h u - 2\lambda u = f(x,y)$$

(8') $$u\big|_L = B(s) \; .$$

For the eigenvalues $\lambda' = 2\lambda$ of the problem (8)-(8') in the case $G \equiv D$ the author obtains the expression

(31) $$\lambda' = -4\left(\frac{1}{h^2}\sin^2\frac{i\pi}{2(m+1)} + \frac{1}{h_1^2}\cos^2\frac{k\pi}{2(n+1)}\right) \quad (i = 1,2,..,m, \; k = 1,2,..n) \; .$$

The method explained in the two-dimensional case is generalized to the three-dimensional case with the net $x_i = x_o + ih$, $y_k = y_o + kh_1$, $z_j = z_o + jh_2$ $(i,j,k = 0, \pm 1, \pm 2, \ldots)$, where for the solution of

(51) $$\Delta_h u - 2\lambda u = f(x,y,z)$$

where $\Delta_h u$ is defined by

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On a New Method for the Numerical Solution of Boundary Value Problems for Elliptic Differential Equations

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(48)
$$\Delta_h u = \frac{1}{h^2}\left\{\left\|\begin{array}{c|c|c} & \alpha^2 & \\ \hline 1 & -2(1+\alpha^2\cdot\gamma^2) & 1 \\ \hline & \alpha^2 & \end{array}\right\| u + \gamma^2[u(x,y,z+h_2)+u(x,y,z-h_2)]\right\} \quad (48)$$

a formula is given which is analogous to the formula (9).
There are 2 tables, 4 figures and 5 references : 2 Soviet and 2 American.

SUBMITTED: January 14, 1960

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APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, Georgiy Nikolayevich; PAKHAREVA, Nadezhda Alekseyevna; STEPANENKO, Ivan Zakharovich; BONDARENKO, Pavel Stepanovich; VELIKOIVANENKO, Ivan Maksimovich; ROZENKNOP, V.D., red.; KRYUCHKOVA, V.N., tekhn.red.

[Mathematics] Matematicheskii praktikum. Pod red. G.N.Polozhego. Moskva, Gos.izd-vo fiziko-matem.lit-ry, 1960. 512 p. (MIRA 14:1)

(Mathematics)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, G.N.

Numerical method of solving boundary value problem for partial differential equations. Dokl.AN SSSR 134 no.1:39-41 S '60. (MIRA 13:8)

1. Kiyevskiy gosudarstvennyy universitet im. T.G.Shevchenko. Predstavleno akad. A.A.Dorodnitsynym.
(Differential equations, Partial)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

Polozhiy, G.N.

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AUTHOR: Polozhiy, G.N. 16

TITLE: A Numerical Method of Solving Boundary Value Problems for Partial Differential Equations 16

PERIODICAL: Doklady Akademii nauk SSR, 1960, Vol. 134, No. 1, pp. 39-41

TEXT: In an approximate solution of boundary value problems for elliptic differential equations by reduction to corresponding difference problems in general there appears a very great number of linear algebraic equations. The author uses the tabulated style of Milu (Ref. 1) for the harmonic $\Delta_h u$ and biharmonic $\Delta\Delta_h u$ difference operators and gives two special formulas for partial difference operators, whereby it is possible to write the solutions of the mentioned algebraic equations in a very simple manner, or to reduce these systems to systems with a smaller number of unknowns. The formulas are valid for the equations

(1) $\Delta_h u - 2\lambda u = f(x,y) \quad (\lambda^2 = \text{const} > 0)$,

(3) $\Delta\Delta_h u = f(x,y)$.

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, Georgiy Nikolayevich; MIRONETS, Ye.M., red.

[Generalization of the theory of analytic functions of complex variables; p-analytic and (p, q)-analytic functions and some of their applications] Obobshchenie teorii analiticheskikh funktsii kompleksnogo peremennogo; p-analiticheskie i (p, q)-analiticheskie funktsii i nekotorye ikh primeneniia. Kiev, Izd-vo Kievskogo univ., 1965. 441 p. (MIRA 18:12)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

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D299/D301

AUTHORS: Polozhiy, H.M. and Kapshyvyy, O.O. (Kyyiv)

TITLE: On solving the axisymmetric problem of the elasticity theory for a finite cylinder

PERIODICAL: Prykladna mekhanika, v. 7, no. 6, 1961, 616-625

TEXT: Mixed axisymmetric problems are considered. Proceeding from the general properties of p-analytic functions it is possible to obtain in closed form the solution to several problems of the type under consideration which were solved earlier by other methods. It is noted that by the method used it is sufficient to expand in Fourier series in trigonometric functions only. In cylindrical co-ordinates x, Θ, y, the basic formulas of axisymmetric theory are

$$2\mu (W - iU) = (k + 1) \Phi(z) + 2x \frac{\partial \Phi(z)}{\partial x} + \Psi(z) \quad (1)$$

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D299/D301

On solving the axisymmetric ...

$$R^{*} + iZ^{*} = \left[- 2x \frac{\overline{\partial \Phi(z)}}{\partial x} - \overline{\Psi(z)} \right]_{L} - \frac{2\mu}{x^{2}} \int_{L} U dy \qquad (2)$$

where

$$k = \frac{\lambda + 3\mu}{\lambda + \mu}; \quad R^{*} = \int_{L} X_{n} ds; \quad Z^{*} = \int_{L} xY_{n} ds$$

U/x and W are the components of the displacement vector, L - a smooth contour, X_n and Y_n - the projections of the stresses, $\Phi(z)$ and $\Psi(s)$ - arbitrary x-analytic functions of the complex variable z. Let L be a horizontal straight line. By using the operator S^{-1}, one obtains from formulas (1) (2):

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On solving the axisymmetric ...

specific axisymmetric problems are considered: 1) The normal displacements and tangential stresses are given on the cylinder ends as well as on its lateral surface; in this case one obtains the explicit formulas:

$$\Phi(z) = P + iQ \quad S\varphi(z) = \sum_{n=1}^{\infty} [a_n{}'\cos\mu_n z - b_n{}'(i\sin\mu_n z)] - \sum_{n=1}^{\infty} c_n{}'(i\,\mathrm{sh}\,\nu_n z) - A'(iz) + \frac{\pi}{2}B, \tag{14}$$

$$\Psi(z) = R + iS = S\psi(z) = \sum_{n=1}^{\infty} [a_n'{}'\cos\mu_n z - b_n'{}'(i\sin\mu_n z)] - \sum_{n=1}^{\infty} c_n'{}'(i\,\mathrm{sh}\,\nu_n z) - A'{}'(iz) + \frac{\pi}{2}B', \tag{14,a}$$

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2) at the end surfaces, the normal displacements and tangential stresses are given, and at the lateral surface the tangential displacements and normal stresses. The solution of the first 2 problems considerably simplifies the solution of the following 2 problems: 3) Normal displacements and tangential stresses at the cylinder ends, normal and tangential stresses at the lateral surface. 4) Normal displacements and tangential stresses at the cylinder ends, normal and tangential displacements at the lateral surface. In a footnote, the authors state that problem 4 has apparently never been solved before. Finally, it is noted that mixed axisymmetric problems with other boundary conditions (for the cylinder under consideration) can be solved explicitly by analogy with the above four problems. There are 1 figure and 9 references: 8 Soviet-bloc and 1 non-Soviet-bloc (in translation).

ASSOCIATION: Kyyivs'kyy derzhavnyy universytet (Kyyiv State University)

SUBMITTED: June 25, 1960

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3"

"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

SUKHARINA, N.N.; POLOZHIY, I.S.

Softening of the white coating when heated in a vacuum. Izv. vys.ucheb.zav.; fiz. no.3:76-79 '63. (MIRA 16:12)

1. Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosudarstvennom universitete imeni Kuybysheva.

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POLOZHIY, S.V., kand. tekhn. nauk, dotsent

Steam power plants with adiabatic steam generation. Izv. vys. ucheb. zav.; energ. 8 no.1:54-62 Ja '65. (MIRA 18:2)

1. Tomskiy ordena Trudovogo Krasnogo Znameni politekhnicheskiy institut imeni S.M. Kirova. Predstavlena kafedroy teploenergeticheskikh ustanovok.

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POLOZHIY, S.V., kand.tekhn.nauk, dotsent

Problem concerning the effect of steam moisture on the efficiency of a turbine stage. Izv. vys. ucheb. zav.; energ. 5 no.7:47-55 Jl '62. (MIRA 15:7)

1. Tomskiy ordena Trudovogo Krasnogo Znameni politekhnicheskiy institut imeni S.M.Kirova. Predstavlena kafedroy teploenergeticheskikh ustanovok. (Steam turbines)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, S.V.

Calculating the parameters of a flow in adiabatic steam generation. Izv. TPI 125:39-44 '64. (MIRA 18:8)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, S.V., dotsent

Experimental study of adiabatic steam formation during steam flow in nozzles. Izv. vys. ucheb. zav.; energ. 6 no.9:78-84 S '63. (MIRA 16:12)

1. Tomskiy ordena Trudovogo Krasnogo Znameni politekhnicheskiy institut imeni Kirova. Predstavlena kafedroy teploenergeticheskikh ustanovok.

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, S.V.

Kinetics of a steam condensation process in a turbine stage.
Izv.TPI 137:79-85 '65. (MIRA 19:1)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

BUTAKOV, Innokentiy Nikolayevich, prof., doktor tekhn. nauk; POLOZHIY, S.V., dots., red.; VOLKOVA, M.I., red.izd-va

[Heat-power systems] Teplosilovye ustanovki. Izd.2., dop. i ispr. Tomsk, Izd-vo Tomskogo univ., Pt.1. 1963. 264 p. (MIRA 17:3)

1. Tomskiy politekhnicheskiy institut imeni S.M.Kirova (for Butakov).

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region in which the vapor phase (steam) of bubbles ... in which the bubbles grow rapidly, in which the capillary pressure falls rapidly ... the steam temperature ... and around the bubble ...

growth of the bubbles and a slow change in the temperature of the steam in the bubble ... the surrounding liquid phase.

... steam is formed, not only on the surface, but also within the liquid phase, the boiling point of any liquid being defined as that temperature at which ...

BLOZHK, S.V.

... liquid under high surface tension as well as on a nonwettable surface. The analytical criteria of G. N. Kruzhilin (Izv. Akad. Nauk SSSR Otd. Tekh. Nauk 1948 (7)) are examined and the erroneous character of the ... used ... the ... diameter of the bubbles at other than atmospheric pressure is pointed out.

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, S.V., kand. tekhn. nauk dots.

Process of steam formation during the outflow of warmed water. Izv. vys. ucheb. zav. energ. 3 no.2:75-82 F '60. (MIRA 13:2)

1.Tomskiy ordena Trudovogo Krasnogo Znameni politekhnicheskiy institut im. S.M. Kirova. Predstavlena kafedroy teploenergeticheskikh ustanovok. (Steam)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHIY, ~~S.V.,~~ kand.tekhn.nauk, dotsent

More about the effect of the degree of steam moisture on the efficiency of a turbine stage. Izv. vys. ucheb. zav.; energ. 6 no.3: 117-121 Mr '63. (MIRA 16:5)

1. Tomskiy ordena Trudovogo Krasnogo Znameni politekhnicheskiy institut imeni S.M.Kirova.

(Steam turbines)

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POLOZHIY, S.V.

25669

Opredelenie opttmal'noy temperatyry isparitelya vakuumnoy ustanovki pri odnostupenchatom isparenii Izvestiya Tomskogo Politekhi in-ta im. Kipova, T. LXVI, VYP. 2, 1948, s. 69-78

SO: LETOPIS' No. 34

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZHYI, G.N.

Method of moving boundary points and majorant fields in the theory of filtration. Ukr.mat.zhur. 5 no.4:380-400 '53. (MLRA 6:12)
(Soil percolation)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

Polozhyi, G.N.

Distr: 4E1/4E2c

2022. Polozhyi, G. N., Some variationally topological theorems for the boundary problems of the torsional theory of shafts of variable cross section: A method of preservation of the region and the majorants (in Russian), Izv. Akad. Nauk SSSR, Ser. Matem. 19, 3, 245-270, 1955; Ref. Zb. Mekh. no. 10, 1956, Rev. 6839.

The stress condition in the torsion of a shaft of variable cross section is determined by the complex stress potential

$$w = u(Z) = \varphi + i\psi$$

where $Z = r + ix$ ($ReZ > 0$), φ displacement function, and ψ stress function, related by the equations

$$\frac{\partial\varphi}{\partial r} = \frac{1}{\mu^3}\frac{\partial\psi}{\partial x}, \quad \frac{\partial\varphi}{\partial x} = -\frac{1}{\mu^3}\frac{\partial\psi}{\partial r}$$

The solution of the problem is thus reduced to finding the function w in the region G bounded by the discontinuously smooth contour L, in the plane $Z = r + ix$ ($ReZ > 0$) representing the axial section of the shaft, from particular contour conditions stated for the boundary L of the region G.

The variation of the complex stress potential is represented by a function of the complex variable:

$$w = u(Z) = w_1 - w = \sigma + i\tau$$

where $w_1 = \varphi_1 + i\psi_1$ - complex stress potential corresponding to the region G_1 obtained from G by such variation of its boundary that $G_1 \subset G$.

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Polozhyi, G. N.

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2

For stress regions bounded by two flow lines and two potential lines, analysis of the hodograph of the function w leads to setting up a group of theorems characterizing the variations in the presence of a constant torsional moment M of the summary angular rotation H, the function φ and the stress vector

$$v = \tau_{r\theta} + i\tau_{z\theta} = \mu r \nabla \varphi = -\frac{i}{r^2} \nabla \psi$$

for (1) diminution of one of the limiting potential lines (i.e., the lines of φ = const); (2) inward bending of the bounding potential line; (3) inward bending of the bounding flow line (i.e., the line ψ = const). Theorems are stated for the same region with the same variation of the boundaries for a variation in the values of M, φ and v with a constant value of H.

Theorems of analogous kind are developed for regions bounded by two flow lines and one potential line and regions bounded by two flow lines, as well as regions containing in their boundaries lines of variable potential.

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The theorems demonstrated are used by the author to support the Saint-Venant principle applied to the torsion of a cylindrical

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FOLOZIKOV, F.I.

Photodepolarization of naphthalene thermoelectrets. Fiz. tver. tela 6 no.9:2854-2856 S '64. (MIRA 17:11)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

PUSTYNNIKOV, V.G., kand.tekhn.nauk; POLOZKOV, A.A., kand.tekhn.nauk

Tensometering agricultural machinery. Trakt. i sel'khozmash. no.1:31-33 Ja '59. (MIRA 12:1)

1. Rostovskiy-na-Donu institut sel'khozmashinostroyeniya.
(Agricultural machinery--Testing)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

SHULIKOVSKIY, Valentin Ivanovich; NORDEN, A.P., red.; POLOZKOV, D.P., red.; MURASHOVA, N.Ya., tekhn. red.

[Classical differential geometry in terms of the calculus of tensors] Klassicheskaia differentsial'naia geometriia v tenzornom izlozhenii. Pod red. A.P.Nordena. Moskva, Fizmatgiz, 1963. 540 p. (MIRA 16:12)

(Geometry, Differential)
(Calculus of tensors)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

NORKIN, Sim Borisovich; BERRI, Roza Yakovlevna; ZHABIN, Ivan Andreyevich; POLOZKOV, Dmitriy Petrovich; ROZENTAL', Mariya Iosifovna; SULEYMANOVA, Khafaza Raziyevna; TAL'SKIY, D.A., red.; YEZHOVA, L.L., tekhn. red.

[Elements of computer mathematics] Elementy vychislitel'noi matematiki. Izd.2., perer. i dop. [By] S.B. Norkin i dr. Moskva, Gos.izd-vo "Vysshaia shkola," 1963. 209 p. (MIRA 16:12)

(Approximate computation)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

POLOZKOV, F.

Observe labor laws strictly. Okhr.truda i sots.strakh. no.6: 57-59 D '58. (MIRA 12:1)

1. Prokuror Kuybyshevskoy oblasti.
(Labor laws and legislation)

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"APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001341830008-3

SARKIS'YANTS, Gayk Arkad'yevich; BEN'YAMINOVICH, Osip Aleksandrovich; KEL'TSEV, Vladimir Vladimirovich; KEL'TSEV, Nikolay Vladimirovich; POLOZKOV, Vladimir Tikhonovich; KHALIF, Al'bert L'vovich; KHODANOVICH, Ivan Yefimovich; RAABEN, V.N., kand. tekhn. nauk, retsenzent; PLETNEV, K.N., inzh., red.; LEVINA, Ye.S., ved. red.; POLOSINA, A.S., tekhn. red.

[Processing and utilization of gas]Pererabotka i ispol'zovanie gaza. [By]G.A.Sarkis'iants i dr. Moskva, Gostoptekhizdat, 1962. 216 p. (MIRA 16:3)

1. Kafedra gaza Azerbaydzhanskogo ordena Trudovogo Krasnogo Znameni instituta nefti i khimii im. M.Azizbekova (for Raaben, Pletnev). 2. Zamestitel' direktor Vsesoyuznogo nauchno-issledovatel'skogo instituta gazovoy promyshlennosti (for Raaben).
(Gas, Natural)
(Gas industry--Equipment and supplies)

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